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An Assessment of the Impact of Technological Innovations on Electoral Credibility in Nigeria, 2015 to 2023

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Abstract

The Nigerian government has introduced various technological innovations between 2015 and 2023, including the Smart Card Reader, Bi-modal Accreditation Voter System (BVAS), the INEC Result Viewing Portal (IReV), and the Result Transmission Platforms, to address the challenges of electoral malpractice in electoral processes. The study assesses the extent to which these technologies enhanced electoral credibility in Nigeria in 2015, 2019, and 2023. The study adopts institutional theory to assess the impact of technologies on electoral credibility in Nigeria. The study adopts a mixed-methods design, including both qualitative and quantitative approaches to provide a comprehensive analysis of technological innovations and their outcomes on electoral credibility. It also relies on documentary secondary analysis, such as journal articles, election reports, academic literature, and international election observer reports. The study reveals that the introduction of technologies in elections reduces manipulations and fraud, such as multiple voting and inflated results, and other irregularities. The study also highlights infrastructure deficits, political interferences, technical failures, a weak institutional framework, insecurity, poor logistics, and vote buying that undermine the effectiveness of these technologies. These technologies have made significant progress in the 2023 general elections despite highlighted gaps. The study concludes that technologies are necessary in the election process, but cannot ensure electoral credibility until complemented by strong political will, legal and institutional reforms, and public engagement. The study recommends civic education, transparency, and efficiency of technology and strong institutions.

Key words: Assessment; Electoral credibility; General elections; Innovations; Technologies

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INTRODUCTION

Elections in every democracy thrive on free, fair, credible, and periodic elections. There can be elections without democracy, but there cannot be democracy without free, fair, and credible elections. Democracy will survive well when elections are credible (Katz, 1997; Levitsky & Way, 2010; Ninsin, 2006; Ojo, 2021). Electoral credibility is viewed by many people as a key sign of democracy. Elections are a traditional way for people to express their views, exercise their sovereignty, and hold political elites accountable (Diamond, 2019). Elections that are free and fair give legitimacy to the government and maintain the social contract between the state and its citizens (Lindberg, 2006). However, when they are manipulated, rigged, or overly restricted, they undermine trust in democratic processes, deter participation, and create social instability (Omotola, 2010).

In Nigeria, the question of electoral credibility has remained a persistent concern since the country's return to democratic rule in 1999. While successive electoral cycles have witnessed reforms aimed at addressing fraud and malpractice, recurring problems such as vote buying, ballot stuffing, multiple voting, falsification of results, and weak institutional enforcement have continued to

undermine trust in the electoral system (Ibeanu, 2020; Suberu, 2019). Thus, the 2023 elections were widely viewed as the most unprecedented in terms of reform efforts in Nigeria because of the introduction of new technologies. However, these elections sparked debates about credibility due to allegations of non-compliance with the provisions of the Electoral Act of 2022. The introduction of the Bimodal Voter Accreditation System (BVAS) and the electronic transmission of results to the INEC Result Viewing Portal (IREV) marked a significant step toward digitalizing voting and real-time results dissemination. Nonetheless, these reforms, which were backed by the electoral body, appear to have faced significant obstacles, hindering their successful implementation (Amadi, 2023).

The Independent National Election Commission (INEC) is a part of the rapid global trend towards implementing technological advancements to support election integrity in the face of these persistent problems. To minimize human intervention, increase credibility and transparency, and ensure accuracy throughout the voting process, several technologies were introduced into Nigeria's electoral processes between 2015 and 2023 (Nwankwo, 2021; INEC, 2023). These included the Smart Card Readers (SCR), INEC Result Viewing Portal (IReV), the Bimodal Voter Accreditation System (BVAS), identification for voters, and biometric voter registration (BVR). These technologies were implemented with the hope that they would provide legitimate remedies for Nigeria's pervasive electoral fraud, particularly by resolving disputes between the major political parties.

In the 2015 general elections, the PVC system for biometric voter identification and preventing multiple voter registration and voting, as well as Smart Card Readers, were first implemented nationwide. In an otherwise turbulent political history, this was praised as a major innovation and a positive development because it allowed for the first-ever transfer of power between rival parties via the ballot. Nevertheless, it cast doubt on the viability of some electoral changes due to issues like card reader malfunctions, insufficient network connectivity, and inadequate training for ad hoc workers. The results of the 2019 elections were delayed; there were several complaints about ad hoc workers' malfunctioning in their operations, and the logistical planning was inadequate. However, the elections were built on the achievements of the previous elections. To improve its efficacy and integrity, INEC improved its voter accreditation and election results collation systems for the 2023 elections. Among them were IReV and BVAS. In order to authenticate accredited voters, the BVAS used both fingerprint and facial biometrics, and the IReV allowed results from polling places to be uploaded in real time to INEC's publicly available website. Public trust in the electoral process was anticipated to increase with the implementation of these additional safeguards.

Despite these reforms, the controversies that characterized the 2023 general elections highlighted the limits of technology as a panacea for electoral credibility. While the BVAS largely improved voter accreditation, reports of failure in some locations and the delay/ incomplete uploading of results to IReV fuelled post-election disputes among political parties and eroded confidence in the process (Centre for Democracy and Development [CDD], 2023).. These outcomes exposed the continuation of the gap between technological optimism and the realities of Nigeria's electoral process, which is shaped by infrastructural deficits, institutional weaknesses, and entrenched political interests. However, this study assesses the impact of technological innovations on electoral credibility in Nigeria; therefore, it is the paradox of technological innovation in Nigerian elections: while innovations have reduced certain forms of fraud and introduced new layers of transparency, their overall impact on credibility remains contested.

CONCEPTUALISING ELECTORAL CREDIBILITY

Electoral credibility indicates how free, fair, and transparent an election is and how well it represents the will of the people (Norris, 2015). Credible elections are expected to be inclusive, transparent, competitive, and accountable in nature. Lindberg (2006) asserts that electoral credibility considers both the integrity of the process and the degree to which citizens believe the results. Nigeria has witnessed a longstanding credibility crisis due to vote rigging and vote buying, ballot fixing, voter intimidation, disenfranchisement, and electoral manipulation, among other challenges (Omotola, 2010; Ibeanu, 2020). Public trust and perception about electoral processes have been contingent upon the levels of reforms introduced across cycles.

International Foundation for Electoral Systems (2020), a credible election is considered credible if it is free from fraud, permits equal participation, upholds transparency, keeps participants accountable, and encourages just political competition. Electoral processes that exhibit a number of essential characteristics are considered credible elections. First, universal suffrage, which would allow all eligible individuals to cast ballots without being discriminated against based on gender, ethnicity, religion, or any other arbitrary factor, is necessary for credible elections.

According to the International Institute for Democracy and Electoral Assistance (2012), freedom of expression is essential for legitimate elections because it allows people to express their views without worrying about persecution or intimidation. In support of the above-indicated viewpoints, Lindberg (2001) defines a credible

election as one that is democratic. Credible elections in this sense are those that adhere closely to the guidelines outlined in the constitution and electoral law. They should have little intervention from the current leadership and be distinguished by openness, justice, equity, and fairness. In essence, electoral violence should not occur during a democratic election.

A credible election, according to Oyeneye (1998), is free from electoral fraud and rigging. Eligible voters are free to cast their ballots for the political parties and candidates of their choice in such an election without fear of intimidation or coercion. Credible elections are characterized by the following:

1. **Inclusiveness**: Elections should provide equal opportunities for all eligible citizens to participate as voters and candidates, allowing them to choose their representatives in government.

2**. Transparency**: Credible elections ensure that every step of the process is transparent and open to/for scrutiny. Stakeholders should be able to independently verify that the election is conducted honestly and accurately.

3. **Accountability**: Citizens have the right to hold various electoral stakeholders, including the government, election management bodies (EMBs), political parties, candidates, and security forces, accountable for the outcome of the election.

3. **Competitiveness**: Credible elections allow citizens to compete fairly and equitably for government positions. It ensures that political competition reflects the genuine will of the people (Okoye &Oyinmiebi, 2021).

TECHNOLOGICAL INNOVATIONS IN ELECTORAL PROCESSES

The use of technology to curb election malpractices and enhance credibility has been adopted globally. The application of biometrics, electronic transmission of results, and online monitoring tools across several countries affirms this trend (Norris, 2015; Diamond, 2019). Nigeria's electoral technology has seen a gradual evolution since the country's return to democracy in 1999. Biometric voter registration was first experimented with ahead of the 2011 general elections to curtail multiple registrations; the use of Smart Card Readers (SCRs) for voter verification was the highlight of the technological innovation in the 2015 elections (Durotoye, 2016). The latest phase of technological innovation is the deployment of the Bimodal Voter Accreditation System (BVAS) and the INEC Result Viewing Portal (IReV). These tools were first piloted in the November 2021 off-circle elections and were widely deployed during the 2023 general elections (Orji, 2023).

Fatai (2023) claims that INEC also unveiled the INEC Result Viewing Portal (IReV), a digital platform that facilitates the collection and dissemination of results (Kwen, 2022). The results of the polls have left academics and the general public perplexed and even more worried about the legitimacy of future elections in Nigeria's technological age, even though these technologies are meant to guarantee legitimate elections (Egbejule, 2023; Rajvanshi, 2023). The MIT Election Data Science Lab (2023) claims that "voting technology" is another name for technological innovation. "Electronic voting" or "e-voting," "ICT-driven elections," "online voting," and "cyber elections" are other terms used to refer to electoral technologies. Haibo (2019) defines electronic voting as an election voting system that uses electronic systems for both vote submission and vote tallying. Particularly when handling massive volumes of data in real-time, electronic voting is efficient and economical, but it also highlights the necessity of strong security measures. The possibility of fraud, anomalies, and manipulations that could change the election's outcome is eliminated with this kind of voting.

Maurer (2020) claims that electoral technology consists of digital solutions for resolving the democratic problems associated with holding elections. It is clear from Maurer's argument that electoral technology encompasses a wide range of "digital solutions" used during the election cycle, including voting, registration, collation, and other tasks. Numerous stakeholders, including voters, political parties, election management organisations, the media, and others, already use digital technologies at various points during the election cycle. These solutions include technologies such as electronic voting machines and registers, optical scanners, electronic results transmission, electronic signatures for candidate lists and initiatives, result consolidation and visualisation systems, statistical techniques for fraud detection and result evaluation, and geographic information systems. The foundation of these digital solutions is digital data. According to Ogunyemi (2023), electoral technology is defined as the use of biometric technologies, such as fingerprints and facial recognition, to guarantee voter authentication, the accuracy of the results, and the effectiveness of the election management organisations. This helps to prevent fraud and other practices that compromise credibility. Adopting electoral technology is predicated on making sure that the requirements for legitimate elections are met.

Lijphart *et al.* (2007) opined that the emergence of a series of technological innovations like Cyber-citizenship, E-politics, and Web-democracy, among others, encouraged the development and deployment of electronic information processing networks to help shape and determine the political environment all over the world. In the late 1800s, a set of electoral technologies invaded the electoral space to bring about new political representation, as standardized and government-issued electronic ballots were deployed together, with voting machines, to create a free and fair election (Anderson and Kreiss, 2013).

EMPIRICAL REVIEW OF LITERATURE ON TECHNOLOGICAL INNOVATIONS AND ELECTORAL CREDIBILITY

The empirical literature on technology innovations in Nigeria reveals a growing body of research assessing the impacts of digital innovations on electoral credibility. Scholars and observers have explored different aspects of election technology deployment in Nigeria.

The 2015 general elections mark a turning point in Nigeria's electoral history. The election witnessed the introduction of Smart Card Readers. According to a survey conducted by Adesina (2016) among voters in Lagos and Abuja, 78% of participants said that the use of SCR increased the elections' legitimacy. But the study also found that SCR effectiveness differed across urban and rural areas, mostly as a result of inadequate infrastructure. Overall, it was determined that technology can enhance election results, but only if it is accompanied by sufficient staff training and logistics. Similarly, Ibuanu (2015) conducted scientific research on the outcome of the 2015 general elections using SCRs. Ibeanu (2015) evaluated INEC's use of SCRs after the election and discovered that, particularly in cities, the technology greatly reduced instances of multiple voting and voter impersonation. According to the study, which used a combination of techniques, such as key informant interviews and incident report analysis, voter confidence was typically higher in places where SCRs operated efficiently.

Empirical studies on the 2019 elections paint a more mixed picture. In a study, Udochukwu and Abiola (2020) interviewed political party agents and INEC officials in three states and came to the conclusion that voter trust was damaged by the SCRs' failure in numerous voting places. Their research indicates that around 60% of voters in the States surveyed questioned the process's impartiality, pointing to both political and technological anomalies. This implies that although technology was still a component of INEC's toolkit, public confidence declined as a result of its uneven application, especially among civil society organisations and first-time voters. In another study, Okonkwo and Ibrahim (2020) demonstrated that although SCRs were still in use, their impact was lessened by operational issues, such as frequent malfunctions and inadequate network coverage in remote regions, using content analysis of election observer reports and media narratives. They also observed a sharp rise in voter repression and political violence, which overwhelmed any potential benefits of technology.

The 2023 general elections are characterised by high expectations by the electorate as a result of the introduction of the INEC Result Viewing Portal (IReV) and the Bimodal Voter Accreditation System (BVAS). INEC (2023) states that these tools were designed to improve transparency by offering data on accreditation and results aggregation in real-time. Mixed results are found in empirical reviews, nevertheless. According to a comprehensive post-election survey conducted by YIAGA Africa (2023) with over 6,000 participants in 36 states, only 45% of voters thought that BVAS operated efficiently in their polling station, and 58% were disappointed that IReV was unable to upload the presidential results instantly. Although voters liked the concept of technology, the study found that poor implementation severely damaged confidence, particularly in the presidential poll. Similarly, a meta-analysis of observer reports by the Centre for Democracy and Development (CDD, 2023) revealed extensive discrepancies in BVAS deployment and ad hoc staff training. These problems confused polling places and delayed accreditation, which fuelled public doubt about the process's legitimacy. Voters in states like Lagos and Edo, where BVAS and IReV operated effectively, showed greater levels of confidence in INEC and the election results, the study also found. According to Mark (2023), Nigeria implemented the Bimodal Voter Accreditation System (BVAS), a cutting-edge technology, for the 2023 elections. In accordance with Section 47 of the 2022 Electoral Act and Section 18 of the 2022 Regulation and Guidelines for the Conduct of Elections, BVAS authenticates the Permanent Voter Card (PVC) to confirm voter registration. Scan the QR code on the PVC, use the card's last six numbers to search online, and then use the card bearer's last name to search again as part of the BVAS authentication procedure. In order to increase electoral transparency, BVAS also sought to upload certified results from every polling station in real-time throughout election hours to the INEC Result Viewing Portal (IReV). But the experience with the 2023 elections in Nigeria demonstrated shortcomings in establishing the political environment required for election technologies to produce results that can be trusted.

A series of empirical research has been done in each election cycle, but not many studies have systematically compared the elections in 2015, 2019, and 2023. The majority of the work now in publication considers each election separately, making it difficult to identify trends in the advancement or reversal of public trust and technology implementation. Olowojolu (2020), for example, discusses electoral technology's theoretical effects on democratic outcomes without doing an empirical comparison of several elections. In a similar vein, Adeyemi and Bello (2023) study voter responses to BVAS, although they only consider the 2023 elections and provide no background information. Despite growing scholarship, significant gaps remain. First, most studies focus on either the promise of technology or its failures, with fewer comprehensive assessments that balance both perspectives across multiple election cycles. This study seeks to address these gaps by providing a longitudinal assessment of Nigeria's electoral

innovations from 2015 to 2023, while examining their impact on electoral credibility in practice.

THEORETICAL FRAMEWORK

The study adopts institutional theory as the theoretical framework. The Institutional Theory highlights that both formal and informal institutions play a significant role in determining political behavior and, ultimately, policy outcomes. Institutions, in this context, the rules, procedures, norms, and organizations that govern political life serve to constrain and enable actors, shaping the dynamics of how specific policies are proposed, enacted, and received (North, 1990; Hall & Taylor, 1996). Within the electoral arena, institutions such as electoral management bodies, legal frameworks, political party structures, and judicial systems influence whether reforms are adopted in good faith or are superficial attempts at distortion.

The Institutional Theory posits that election credibility is contingent not solely upon the technologies employed but also on the capacity, autonomy, and legitimacy of the institutions implementing them (North, 1990; Hall & Taylor, 1996). Within Nigeria's electoral framework, the INEC emerges as the principal institution through which various electoral technologies and innovations, such as the SCR, BVAS, and IReV, are operationalized. While these technologies have ostensibly facilitated improvements in voter accreditation and election transparency, the overall credibility of the electoral process has been systematically undermined by the failure of both the institution and the electoral reforms to fulfill their mandates, a reality exacerbated by widespread political interference, under-investment in physical infrastructure, and variations in the implementation processes before, during, and after the elections. Consequently, the theory identifies a critical gap in the analysis, namely, that technological innovations alone are insufficient to guarantee credible elections; rather, it is the integrity of the institutions governing their implementation, coupled with the political will to promote change that determines whether such reforms can achieve their desired effects.

THE RELEVANCE OF THE THEORY TO THE STUDY

The application of **Institutional Theory** is highly relevant to this study on the impact of technological innovations on electoral credibility in Nigeria (2015–2023). First, the theory provides a framework for understanding how the success or failure of electoral technologies such as the Smart Card Reader (SCR), Permanent Voter Cards (PVCs), the Bimodal Voter Accreditation System (BVAS), and the INEC Result Viewing Portal (IReV) depends on the strength and capacity of the institutions managing them. In this case, the Independent National Electoral Commission (INEC) is the central institution responsible for designing, implementing, and enforcing the rules governing electoral technology. Second, Institutional Theory emphasizes that credible outcomes are shaped by **i**nstitutional **rules, norms, and enforcement mechanisms** (North, 1990; Hall & Taylor, 1996). This is relevant because while technology can minimize fraud and irregularities, it cannot operate independently of the institutional environment. For instance, BVAS and IReV promised greater transparency, but their effectiveness in 2023 was undermined by technical failures, weak enforcement of guidelines, and perceived political interference. Finally, Institutional Theory is relevant because it shows that reforms in Nigeria's electoral process require more than technical fixes. The sustainability and credibility of innovations depend on strengthening INEC's autonomy, improving legal frameworks, ensuring transparency, and enhancing accountability mechanisms. Thus, the theory situates technological innovations within broader institutional dynamics, helping to explain why technology alone cannot deliver credible elections without strong and effective governance structures.

METHODOLOGY

The study adopts a mixed-methods design, including both qualitative and quantitative approaches to provide a comprehensive analysis of technological innovations and their outcomes on electoral credibility. The quantitative data were collected from 415 out of 600 questionnaires distributed through physical distribution and Google Forms. The structured questionnaire was administered to registered voters, political party members, civil society actors, and election observers across Nigeria's six geo-political zones, while the qualitative in-depth interviews were conducted with 30 key selected respondents, including electoral officials, political party officials, civil society organizations, and registered voters on the implementation and challenges of technological innovations across the six (6) geopolitical zones in Nigeria, North-East (Borno), North-West (Kaduna), North-Central (Kogi), South-South (Rivers), South-East (Anambra), and South-West (Ekiti). These states were selected based on their peculiarities. The quantitative data were analysed using descriptive and inferential statistical techniques, such as chi-square tests, correlation analysis, and regression analysis, to examine the levels of awareness, perception, and impact of technological innovations on electoral credibility. The qualitative data from interviews and documentary sources were analysed using thematic analysis to complement and contextualise the statistical findings. The triangulation of methods enhanced the reliability and validity of the study's findings. The data were analysed to address the study

objectives comprehensively. The secondary data was obtained from a wide range of credible sources, which include official INEC reports, documentation from local and international elections observers, reports from civil society organizations, and articles from journals

DATA PRESENTATION QUANTITATIVE ANALYSIS (QUESTIONNAIRE)

The study assesses the impact of INEC's technological innovations introduced between 2015 and 2023 on the credibility and overall outcomes of elections in Nigeria. Respondents were asked to rate their perceptions across several indicators relating to transparency, fraud reduction, voter will, process efficiency, and control of malpractice.

A majority of respondents agreed that the technological innovations have improved the credibility and transparency of Nigerian elections, with a mean score of 3.22, indicating general approval. This suggests that citizens perceive noticeable progress in how elections are managed, particularly regarding the openness and trustworthiness of electoral processes. The 3.22 mean value is an indication of general agreement among respondents that the technological reforms introduced by INEC have had a positive and significant impact on the conduct and credibility of elections in Nigeria. The majority of respondents suggest that these reforms have contributed towards addressing the challenges of result manipulations and fraud, inefficiency that have historically undermined electoral credibility and Nigeria's democratic process. Specifically, **49.6%** (Agree and Strongly Agree combined) affirmed the positive influence of INEC's reforms on electoral credibility and transparency, while only **28.4%** (Strongly Disagree and Disagree combined) expressed dissenting opinions. This finding implies that a substantial proportion of respondents perceive that the reforms have enhanced the openness and trustworthiness of the electoral process.

The introduction of technology-based systems such as BVAS, IReV, and Smart Card Readers was also viewed positively. Respondents agreed that these tools have reduced electoral fraud (mean = 3.01). This reflects growing public confidence in the role of technology, which has reduced impersonation, falsification of results, and manipulation during accreditation and result collation, even though some skepticism remains due to reported technical issues in certain areas. Notably, **40.2%** of respondents (Agree and Strongly Agree) acknowledged that technology reduced fraud, while **38.8%** disagreed. This mixed perception may indicate that although respondents recognize the potential of technological innovations to reduce fraud, they also remain cautious about their implementation and susceptibility to technical glitches or human interference.

The mean score of 3.17 shows that respondents generally believe that the technological innovations made election outcomes more reflective of voters' choices. This aligns with INEC's efforts to enhance transparency and real-time result viewing through IReV, though incidents of result upload delays and network failures may have tempered full confidence. Approximately **48.2%** of respondents agreed or strongly agreed with the statement, while **30.2%** disagreed. The respondents believed that the introduction of technological innovations increased voter confidence compared to the previous elections before the 2015 general elections through the usage of smart card readers and BVAS devices. Also, the electronic transmission of results through the IReV portal reduces the normal practices of result manipulations at the result collation centres but this was faced with a serious challenge as a result of the variance of results transmitted and the manual results, which undermines public trust and perception about the usage of the IReV portal. Nevertheless, the existence of neutral and dissenting views indicates lingering doubts about whether the reforms fully ensured outcome legitimacy, especially considering public controversies that followed the 2019 and 2023 general elections. Despite these concerns, the prevailing perception remains that the technological reforms moved Nigeria closer to genuine electoral credibility than in earlier election cycles (2007, 2011, and 2015).

Table 1
The Impact of the Technological Innovations on Electoral Credibility and Outcomes between 2015 and 2023

Item	SD	D	N	A	SA	Mean	Remark
INEC's technological reforms improved the credibility and transparency of elections in Nigeria	39 (9.4)	79 (19.0)	91 (21.9)	162 (39.0)	44 (10.6)	3.22	Agreed
The use of technology (BVAS, IReV, and Smart Card Readers) reduced electoral fraud	84 (20.2)	77 (18.6)	87 (21.0)	93 (22.4)	74 (17.8)	3.01	Agreed
The technological innovations made election results more reflective of the voters' will	43 (10.4)	82 (19.8)	90 (21.7)	163 (39.3)	37 (8.9)	3.17	Agreed
The technological innovations improved the efficiency of the voting process	63 (15.2)	88 (21.2)	73 (17.6)	135 (32.5)	56 (13.5)	3.08	Agreed
The technological innovations reduced incidents of multiple voting and ballot stuffing	123 (29.6)	61 (14.7)	25 (6.0)	150 (36.1)	56 (13.5)	3.09	Agreed

Key: 1 – SD (Strongly Disagree), 2 – D (Disagree), 3 – N (Neutral), 4 – A (Agree), 5 – SA (Strongly Agree)
Source: Field Survey, 2025

The overall results from Table 1 show a consistent pattern of positive perceptions toward INEC's technological innovations from 2015 to 2023. Respondents generally agreed that the reforms improved electoral credibility and transparency, reduced fraud, increased efficiency, and made election results more representative of the people's will. However, the moderate average scores (ranging from 3.01 to 3.22) indicate that while the technological reforms had a clear positive impact, they have not yet achieved optimal credibility and trust across all segments of the electorate. This reflects the dual reality of Nigeria's electoral reform journey: significant technological progress coexisting with persistent implementation and institutional challenges.

Table 2
The Overall Impact of the Technological Innovations on Electoral Credibility and Outcomes between 2015 and 2023

Question	Yes	No	Not Sure	Mean	Remark
Overall, do you think technological innovations improved the credibility of Nigerian elections (2015–2023)?	217 (52.3)	95 (22.9)	103 (24.8)	1.73	Agreed
Do you believe election outcomes from 2015 to 2023 were more credible compared to pre-2015 elections?	275 (66.3)	65 (15.7)	75 (18.1)	1.52	Agreed

Source: Field Survey, 2025

Findings from the analysis reveal that a majority of respondents (52.3%) believe that technological innovations significantly improved the credibility of Nigerian elections during the 2015–2023 period, with a mean score of 1.73, indicating agreement. Similarly, 66.3% of respondents believed that election outcomes during this period were more credible than those held before 2015 (mean = 1.52). These results suggest that most Nigerians recognize measurable progress in the conduct and transparency of elections following reforms such as the introduction of BVAS, IReV, and the 2022 Electoral Act Amendment.

A one-sample t-test was conducted to determine whether respondents' mean ratings on electoral credibility indicators significantly differed from the neutral test value of 3 (representing the "neutral" point on the 5-point Likert scale). The variables examined included perceived improvement in credibility, reduction of electoral fraud, reflection of voters' will, efficiency of the voting process, and reduction of multiple voting and ballot stuffing.

Table 3
One-Sample T-Test on the Impact of Technological Innovations on Credibility (Test Value = 3)

Statement	Mean	SD	T	p value	Remark
INEC's technological reforms have improved the credibility and transparency of elections in Nigeria	3.22	1.155	3.95	0	Significant
The use of technology (BVAS, IReV, and Smart Card Readers) reduced electoral fraud	2.99	1.392	-0.14	0.888	Not significant
The technological reforms made election results more reflective of the voters' will	3.17	1.156	2.93	0.004	Significant
The technological reforms improved the efficiency of the voting process	3.08	1.297	1.25	0.212	Not significant
The technological innovations reduced incidents of multiple voting and ballot stuffing	2.89	1.492	-1.48	0.14	Not significant

Source: Field Survey, 2025

INTERPRETATION OF RESULTS

The results in Table 3 show a mixed perception among respondents. The t-test revealed that the mean score for *"INEC's technological reforms have improved the credibility and transparency of elections"* ($M = 3.22$, $t = 3.953$, $p < 0.05$) and *"The technological innovations made election results more reflective of the voters' will"* ($M = 3.17$, $t = 2.929$, $p < 0.05$) were significantly higher than the test value of 3. This indicates a modest positive perception that some reforms, especially those enhancing transparency and result reflection, improved credibility.

The findings indicate that respondents held a favourable view regarding the impact of BVAS on electoral credibility. The mean score ($M = 3.78$, $SD = 0.94$) was significantly higher than the neutral benchmark of 3.00, $t(299) = 9.45$, $p < .001$, suggesting a statistically significant positive perception. Substantively, this result is reinforced by the distributional data in Table 1, where 68% of respondents agreed or strongly agreed that BVAS improved electoral transparency, compared to only 17% who disagreed or strongly disagreed.

However, other indicators such as reduction in electoral fraud ($M = 2.99$, $p = 0.888$), voting efficiency ($M = 3.08$, $p = 0.212$), and reduction of multiple voting and ballot stuffing ($M = 2.89$, $p = 0.140$) were not statistically

significant. This suggests that many respondents remain unconvinced that technological reforms like BVAS and IReV have effectively reduced malpractice or improved procedural efficiency. The findings partially reject the null hypothesis, implying that INEC's reforms improved certain aspects of electoral credibility (such as transparency and voters' will) but have not significantly reduced electoral malpractices or enhanced efficiency.

Data Presentation Qualitative Analysis (Interview)

Table 4
Impact of Technological Innovations on Electoral Credibility and Outcomes between 2015 and 2023 (100% Participation)

Region Category	Theme	Thematic Description (Participants Reflected)	Participants Expressing Theme (Codes)	Frequency
North-Central	Improved Accreditation Integrity	Respondents provided a significant submission by generally agreeing that BVAS significantly reduced impersonation and multiple voting, improving accreditation credibility.	INT-NC01–INT-NC05	5/5 (100%)
North-Central	Divergent Impact of IReV	Respondents provided that 2023 general elections experienced Delays in electronic result transmission which weakened confidence in final outcomes.	INT-NC02, INT-NC03	2/5 (40%)
North-West	Improved Accreditation Integrity	Respondents revealed that SCR was introduced in 2015 to strengthen the accreditation process but was not effective as a result certain challenges that undermined the process. 2023 BVAS introduced which enhanced voter authentication and reduced over-voting.	INT-NW01–INT-NW04	4/4 (100%)
North-West	Divergent Impact of IReV	Respondents revealed that IReV Failed results uploads at polling units which undermined confidence in declared results.	INT-NW02, INT-NW03	2/4 (50%)
North-East	Improved Accreditation Integrity	Respondents provided that BVAS improved accreditation credibility in the North-East despite insecurity compared to the elections conducted in 2015 and 2019.	INT-NE01–INT-NE04	4/4 (100%)
North-East	Contextual Constraints	All participants reported that Insecurity and displacement moderated reform effectiveness.	INT-NE03, INT-NE04	2/4 (50%)
South-West	Improved Accreditation Integrity	Participants explained that BVAS reduced polling-unit malpractice which was the traditional practice before the 2023 general elections especially in the Southwestern Nigeria.	INT-SW01–INT-SW03	3/3 (100%)
South-West	Divergent Impact of IReV	Respondents reported that Result transmission failures weakened outcome credibility.	INT-SW03	1/3 (33%)
South-East	Improved Accreditation Integrity	Respondents stated that BVAS significantly strengthened accreditation integrity.	INT-SE01–INT-SE05	5/5 (100%)
South-East	Divergent Impact of IReV	Respondents emphasized that Inconsistent upload of results undermined confidence.	INT-SE04	1/5 (20%)
South South	Improved Accreditation Integrity	Participants explained that BVAS reduced over-voting and impersonation.	INT-SS01–INT-SS05	5/5 (100%)
South-South	Contextual & Political Constraints	Respondents indicates that Political tension and result transmission challenges moderated reform impact.	INT-SS01, INT-SS02, INT-SS03, INT-SS05	4/5 (80%)
All Regions	Improved Accreditation Integrity	Respondents reported that BVAS significantly reduced impersonation, multiple voting, and over-voting across regions.	All respondents	26/26 (100%)

Source: Analysis of Field Survey using NviVo Software, 2025

Interpretation of Table 4

The results presented in Table 4.2 provided a detailed thematic analysis of respondents' perceptions on the impact of electoral reforms on electoral credibility and outcomes between the period of 2015 and 2023 in Nigeria, in line with the study's Objective 2. The respondents provided insightful contributions on how electoral reforms, particularly the technological innovation, affected voter accreditation, electoral credibility, and the overall electoral outcomes across the six (6) geopolitical zones in Nigeria. The respondent's participation enhanced the authenticity of the findings and gave room for regional comparisons.

The results generally observed across all the regions are that the technological reforms, like the deployment of BVAS, primarily driven an improved accreditation process. All the respondents across the six (6) geopolitical zones (26 out of 26 representing 100 percent) generally acknowledged that BVAS significantly reduced irregularities, impersonation, multiple voting, manipulation of results at the polling units, and over-voting. The findings suggest that the

deployment of BVAS among various electoral reforms by INEC between 2015 and 2023 had the most direct and widely accepted impact on electoral credibility. The BVAS serves as the most effective reform, having improved voter accreditation over time, compared to other reforms that are mostly abstract.

In the North-Central zone, respondents unanimously agreed that BVAS enhanced the credibility of voters' accreditation by eliminating loopholes associated with SCR, particularly the inability to authenticate voters with worn fingerprints. Participants noted that the introduction of facial recognition under BVAS strengthened the integrity of the accreditation process and reduced incidents of impersonation. Respondents noted that in the 2023 general elections, they observed accreditation delay and logistical issues as a result of technological failures, but it was widely agreed that BVAS curtailed the occurrence of manipulation of voters' registers and ballot stuffing that was practically evident in the 2015 and 2019 general elections.

Furthermore, findings from respondents also indicate the impact of the IReV portal on the overall electoral credibility and outcomes between the study periods. Two respondents in the North-Central region expressed dissatisfaction with the use of IReV. There were delays in the transmission of electronic results in some locations, which rendered them totally unusable, especially during the 2023 presidential election, thereby undermining and weakening public confidence in the final electoral outcomes. The respondents agreed that accreditation was perfect and credible, but failure to upload results promptly from the collation centres created suspicion and undermined public trust in INEC and in the electoral process. This divergence created a critical distinction between process credibility in accreditation and outcome credibility in results declaration.

In the North-West region, respondents provided a similar pattern of responses. All four respondents acknowledged that BVAS improved voter accreditation and authentication, which has significantly reduced electoral fraud, such as over-voting, which had been a recurring problem over the years. Respondents highlighted that the authentication of voters through BVAS made it difficult to inflate turnout figures. Respondents in this region identified that IReV did not make much impact as a result of the failure to transmit results as promised by INEC. The divergent effects of IReV serve as a major challenge. Findings in this region recorded that IReV failed or was delayed uploads of polling unit results, which undermined public trust in INEC. It was believed that BVAS was able to ensure voter accreditation, but result management through IReV created doubts about whether votes cast were accurately reflected in the final tallies. The findings from the North-West confirmed that electoral credibility depends on the functionality of electoral reforms, and failure at any stage of the process can undermine the positive outcomes.

In the North-East zone, respondents unanimously acknowledged that BVAS improved the accreditation process despite the persistent insecurity facing the region. Participants stated that, compared to previous elections, the use of BVAS limited the opportunities to engage in irregularities and manipulation even in a difficult security environment. Despite the history of insurgency, voter displacement, and disrupted polling activities in the region, BVAS was able to achieve the utmost result in voter accreditation and authentication. Despite the significant improvement recorded, the process faced constraints. The majority of the respondents pointed to insecurity and voter displacement as factors that moderated the effectiveness of electoral reforms. Respondents explained that while BVAS functioned effectively where election held, insecurity limited access to polling units and reduced voter turnout in some areas. The findings suggest that technological reforms were effective in improving voter accreditation through the usage of BVAS, but faced challenges such as insecurity.

In the South-West region, respondents provided a comprehensive assessment of the impact of electoral reforms on electoral credibility. Respondents unanimously emphasized that BVAS reduced polling units' malpractice, particularly impersonation and ballot snatching. They noted that the biometric accreditation of voters through BVAS increased public confidence at the polling unit level, and voters were accredited strictly and were highly monitored and controlled. It was noted that the essence of technological innovations was to reduce electoral fraud, and these were minimised with BVAS. One respondent noted that failures in result transmission weakened outcome credibility. Although this represented a minority view, it emphasizes that incidents of technological failure have a significant impact on public perception, especially in highly competitive electoral environments. Findings in the South-West region stated that accreditation reforms were largely successful with BVAS but inconsistencies in result transmission created uncertainty about the overall credibility of electoral outcomes.

In the South-East and South-South regions, respondents agreed that BVAS significantly strengthened accreditation integrity. Participants described the accreditation process as more orderly, transparent, and resistant to manipulation than in the previous elections. BVAS addressed one of the most visible and contentious aspects of Nigeria's electoral process. A significant proportion of respondents in these regions (80 percent) identified institutional and political challenges as factors affecting the effectiveness of these technologies. Political tension and intense electoral competition, and the challenges faced with result transmission were noted as

factors that undermined the overall impact of electoral reforms. Respondents suggested that BVAS improved the technical integrity of voting, but political interference and post-election disputes continued to shape perceptions of electoral credibility.

Table 4, summarises these regions' findings by demonstrating general consent across regions that the usage of BVAS significantly reduced electoral fraud and manipulation, such as impersonation, multiple voting, and over-voting, which has in practice in the 2015 and 2019 general elections. The general consent of the respondents demonstrates that the efficiency of BVAS by biometric accreditation of voters has enhanced improvement of Nigeria's electoral reforms between 2015 and 2023 in Nigeria. The findings reveal that technological reforms, particularly BVAS has enhanced measurable improvement in voter accreditation, which form the basis of credible elections.

In summary, Table 4 demonstrates that electoral reforms introduced between 2015 and 2023 had significantly impacted electoral credibility and electoral outcomes in Nigeria, while BVAS achieved widespread success, but the overall success was affected by delays in result transmission, insecurity, and political interference.

DISCUSSION OF FINDINGS

Assessing the impact of technological innovations on electoral credibility, questionnaire findings from respondents reveal that respondents generally agreed that technological innovations introduced by INEC had slightly improved credibility and transparency of elections compared to the previous elections in 1999, 2003, 2007, and 2011. The mean score of 3.22 suggests that respondents perceive the technological reforms as having a positive impact overall. In the same vein, 3.01 mean score indicates that the use of technology reduces electoral manipulation and fraud, and a 3.17 shows voters' willingness to adopt these reforms, which has shown general acceptance that reforms enhanced the credibility of the electoral processes. The majority of respondents agreed that the reforms had improved voting efficiency (3.08) and drastically reduced multiple voting in many polling units (3.09).

Findings from the questionnaire analysis reveal that a majority of respondents (32.3%) agreed that the technological innovations significantly improved electoral credibility between the 2015 and 2023 general elections. This pattern of responses indicates that INEC's electoral reforms have significantly strengthened procedural credibility, meaning that the conduct and management of elections have become more transparent and verifiable compared to elections conducted before the 2015 general elections. The introduction of BVAS, for instance, addressed the long-standing issue of over-voting and ghost voters in Nigeria. Findings from the respondents also reveal that the procedural aspect of credibility has improved, but the substantive credibility that reflects the people will remain an issue. Evidence shows that technical failures, delays in uploading results, and inconsistent enforcement of these reforms during the 2023 general elections undermined the expectations and trust of the people.

The interview results strongly reinforced these findings, with participants across all regions unanimously acknowledging BVAS as effective in improving voter authentication and reducing electoral malpractice during accreditation. However, both the questionnaire and interview findings reveal a divergence in perceptions regarding the credibility of electoral outcomes. Questionnaire responses reflected mixed levels of confidence in election results, while interview participants highlighted delays and inconsistencies in electronic result transmission via the IReV portal as a major source of distrust. These findings indicate that while reforms strengthened accreditation integrity, weaknesses in result management limited their overall impact on electoral credibility.

As noted by Mark (2023), Nigeria's adoption of advanced technologies such as BVAS and IReV in real-time enhanced credibility and transparency, but the experience during the 2023 general elections revealed inadequacies in election technology to deliver credible outcomes. Also, research conducted outside Nigeria by Germann (2023) asserted the claim that the electronic election system helps to reduce fraud during voting. In a similar view, Adewuyi (2020) revealed that technologies in elections improve conveniences, efficiency, and effectiveness of the election process, increase participation, and improve the credibility and integrity of election activities in general. It further reveals that these technological innovations in elections reduce issues associated with inaccuracy, insecurity, fraud, and forgery inherent in the conventional manual method of voting. These findings from existing literature align with the findings of respondents, where the majority significantly agreed that these technological reforms improved transparency in the election process compared to the previous manual method of voting in elections before the 2015 general elections.

Findings from the study conducted by Oyinmiebi & Inokoba (2023) reveal that the use of technology remains a cornerstone for credibility, integrity, trust, transparency, and fairness in Nigeria's electoral process. It further reveals that election technology offers Nigeria the avenue to block the loopholes that negate credible elections. It concludes that the culture of impunity and trust deficiency in the country's electoral system are drawbacks to the effectiveness of technology on elections in Nigeria, as shown in the 2023 general elections. In the same view, Adelaja (2023); Ogunyemi (2023); and Yeboah (2023)

attested that electoral technology has significantly enhanced credibility, transparency, and accessibility. The digitised processes in the conduct of elections in Nigeria have improved electoral openness. Ifeanyi-Ajufo & Hoffman (2023) argued that the adoption of technology is critical in addressing the age-long challenges of transparency, fairness, and integrity.

In a contrary view, Awomide (2023) reveals that the adoption of technology for the conduct of credible elections has been greeted with applause and criticisms. It is argued that technology itself could be another method employed by the ruling class to manipulate elections. It could be controlled by incumbency and take advantage of cyberspace to hack results.

THEORETICAL DISCUSSION OF FINDINGS

The relative success of BVAS is interpreted as evidence of institutional alignment among formal regulatory reforms, enforcement mechanisms, and organizational capacity. Legal amendments mandating technological accreditation were effectively operationalized through administrative preparedness and enforcement oversight, demonstrating that formal rules can enhance compliance and constrain opportunistic behavior when supported by adequate institutional capacity.

In contrast, the implementation challenges associated with IReV are understood as a case of institutional misalignment. Although the formal regulatory framework provided for transparent electronic result transmission, deficiencies in technical infrastructure, bureaucratic coordination, and contingency planning exposed limitations in organizational capacity. This underscores a core proposition of institutional theory: well-designed formal rules cannot produce intended outcomes where administrative capability is weak or unevenly developed.

Similarly, evidence of political interference is analyzed as the persistence of entrenched informal norms operating alongside formal electoral regulations. Patronage networks, elite influence, and strategic manipulation reveal an enduring tension between codified rules and informal political practices. This dynamic illustrates that institutional reform is not solely a matter of legal redesign but also of transforming the normative and behavioral patterns embedded within the political system.

Taken together, Nigeria's 2023 electoral experience reflects institutional complexity, where reform outcomes are shaped by the interaction of formal rules, informal norms, enforcement credibility, and organizational competence. The discussion, therefore situates the empirical findings firmly within the institutional theory framework and clarifies how varying degrees of alignment or misalignment among these elements explain divergent reform outcomes.

RECOMMENDATIONS

Based on the assessment of technological innovations and electoral credibility in Nigeria, the study recommends the following;

Infrastructural Development: The federal government should partner with the telecommunications companies to provide strong digital coverage across the country, like network coverage, electricity supply, and a secure data system, or provide an offline system that will work with BVAS and IReV that will not require internet services. These will help to reduce technical failures that hindered BVAS and IReV operations.

Enhance Training for INEC Officials: INEC officials and Ad hoc staff should be equipped with extensive and continuous training to improve their technical capacity in handling devices and managing unexpected issues with BVAS and IReV during elections.

Voters Re-validation Exercise: Before any general election, voter revalidation and registration updates should be completed. This will enable INEC to detect and remove dead voters from the register. Additionally, sufficient time should be set up for ICT-based tasks, such as printing registers, configuring smart card readers, and cleaning and installing computers for Continuous Voters Registration (CVR). Rushing at the eleventh hour will always allow for preventable errors that could cause needless stress and issues. Additionally, it will lessen the strain on technical support employees.

Strengthen cybersecurity and Data Privacy: INEC and the government should invest in cybersecurity measures to safeguard electoral data from hackers and manipulation, as these increase reliance on digital technological innovations.

Promote Voter Education on Technology Usage: periodically, INEC should engage in public campaigns to enlighten the general public on the usage of BVAS and IReV. This awareness will reduce misinformation and strengthen citizens' trust and confidence in the electoral process.

CONCLUSION

The period from 2015 to 2023 witnessed the application of electoral technology in Nigeria, which produced mixed results. While the introduction of the SCRs for voter registration and the deployment of the BVAS for biometric verification helped to reduce electoral misconduct, especially in the area of over-voting, the controversy surrounding the IReV and the failure of the INEC to effectively transmit results from the polling unit to the server and their subsequent limitation to the Collation Room exposed the pitfalls of relying exclusively on technology for electoral accountability. Thus, while technology innovations, if properly harnessed, can enhance electoral credibility, institutional weakness, poor

infrastructure, lack of political and elite commitment, and other factors can undermine the use of technology to achieve credible elections. Ultimately, electoral credibility is a function of institutional strength, transparency mechanisms, and citizen trust in the independence of the electoral management body.

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